Amendments to the Claims:

1. (Currently Amended) A method of simulating ~~determining~~ a volume of liquid within a tank during motion, comprising:

receiving tank geometry information;

receiving sensor configuration information;

receiving tank motion information;

computing one or more ~~a~~ fuel-plane-to-sensor intersections for at least one tank position based on the tank motion information;

computing one or more wetted volumes, each wetted volume being computed at a ~~wetted volume at every~~ fuel-plane-to-sensor intersection for each sensor location based on the sensor configuration information; and

computing a fuel quantity at every fuel-plane-to-sensor intersection based on a sum of the one or more wetted volumes.

2. (Original) The method of Claim 1, further comprising computing an error for each computation of fuel quantity, and comparing the error with at least one previously computed error.

3. (Original) The method of Claim 2, further comprising adjusting a gain of at least one of the sensors based on the comparison between the error and the previously computed error, and repeating the computing of the wetted volumes, the computing of the fuel quantities, the computing of the error, and the comparing of the error.

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4. (Original) The method of Claim 1 wherein receiving tank geometry information includes receiving height-to-volume values.

5. (Currently Amended) The method of Claim 1 wherein receiving tank geometry information includes receiving an input file of height-to-volume values from a storage device, the height-to-volume values being obtained by incrementally slicing through a computer aided design model of the tank at a given attitude, each slice being providing an incremental volume of the tank.

6. (Currently Amended) The method of Claim 1, wherein computing one or more ~~a~~ fuel-plane-to-sensor intersections includes interpolating the height-to-volume information from the tank geometry information to a desired attitude.

7. (Currently Amended) The method of Claim 1, wherein computing one or more ~~a~~ fuel-plane-to-sensor intersections includes mathematically transforming sensor coordinates from the sensor configuration information.

8. (Currently Amended) The method of Claim 1, further comprising computing one or more errors for each computation of wetted volume, and determining a non-linearity condition of a fuel gauging system based on one or more of the computed errors.

9. (Original) The method of Claim 8, further comprising optimizing the error for a single motion condition if the fuel gauging system is non-linear.

10. (Original) The method of Claim 9, wherein the single motion condition includes a single attitude.

11. (Original) The method of Claim 8, further comprising optimizing the error for a plurality of motion conditions if the fuel gauging system is non-linear.

12. (Original) The method of Claim 11, wherein the plurality of motion conditions includes a plurality of attitudes.

13. (Currently Amended) A computer-readable medium encoded with a computer program product for simulating ~~determining~~ a volume of liquid within a tank during motion, comprising:

a first computer program portion adapted to receive tank geometry information;

a second computer program portion adapted receive sensor configuration information;

a third computer program portion adapted to receive tank motion information;

a fourth computer program portion adapted to compute one or more ~~a~~ fuel-plane-to-sensor intersections for at least one tank position based on the tank motion information;

a fifth computer program portion adapted to compute one or more wetted volumes, each wetted volume being computed at a~~-wetted volume at every~~ fuel-plane-to-sensor intersection for each sensor location based on the sensor configuration information; and

a sixth computer program portion adapted to compute a fuel quantity at every fuel-plane-to-sensor intersection based on a sum of the one or more wetted volumes.

14. (Currently Amended) The computer-readable medium ~~computer program product~~ of Claim 13, further comprising a seventh computer program portion adapted to compute an error for each computation of fuel quantity, and to compare the error with at least one previously computed error.

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15. (Currently Amended) The <u>computer-readable medium</u> ~~computer program product~~ of Claim 14, further comprising a seventh computer program portion adapted to adjust a gain of at least one of the sensors based on the comparison between the error and the previously computed error.

16. (Currently Amended) The <u>computer-readable medium</u> ~~computer program product~~ of Claim 13, wherein the first computer program portion is adapted to receive height-to-volume values.

17. (Currently Amended) The <u>computer-readable medium</u> ~~computer program product~~ of Claim 13, wherein the fourth computer program portion is adapted to interpolate height-to-volume information from the tank geometry information to a desired attitude.

18. (Currently Amended) The <u>computer-readable medium</u> ~~computer program product~~ of Claim 13, further comprising a seventh computer program portion adapted to <u>compute one or more errors for each computation of fuel quantity, and to</u> determine a non-linearity condition of a fuel gauging system based on one or more of the computed errors.

19. (Currently Amended) The <u>computer-readable medium</u> ~~computer program product~~ of Claim 18, further comprising an eighth computer program portion adapted to optimize the error for at least one motion condition if the fuel gauging system is non-linear.

20. (Currently Amended) The <u>computer-readable medium</u> ~~computer program product~~ of Claim 19, wherein the at least one motion condition includes an attitude.

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21. (Currently Amended) A system for simulating ~~determining~~ a volume of liquid within a tank during motion, comprising:

a control component;

an input/output device coupled to receive input ~~vibrational~~ data; and

a processor arranged to analyze the input ~~vibrational~~ data, the processor including:

a first portion adapted to receive tank geometry information;

a program portion adapted receive sensor configuration information;

a third portion adapted to receive tank motion information;

a fourth portion adapted to compute one or more ~~a~~ fuel-plane-to-sensor intersections for at least one tank position based on the tank motion information;

a fifth portion adapted to compute one or more wetted volumes, each wetted volume being computed at a ~~wetted volume at every~~ fuel-plane-to-sensor intersection for each sensor location based on the sensor configuration information; and

a sixth portion adapted to compute a fuel quantity at every fuel-plane-to-sensor intersection based on a sum of the one or more wetted volumes.

22. (Original) The system of Claim 21, wherein the processor further includes a seventh portion adapted to compute an error for each computation of fuel quantity, and to compare the error with at least one previously computed error.

23. (Original) The system of Claim 22, wherein the processor further includes a seventh portion adapted to adjust a gain of at least one of the sensors based on the comparison between the error and the previously computed error.

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24. (Original) The system of Claim 21, wherein the first portion is adapted to receive height-to-volume values.

25. (Original) The system of Claim 21, wherein the fourth portion is adapted to interpolate height-to-volume information from the tank geometry information to a desired attitude.

26. (Currently Amended) The system of Claim 21, wherein the processor further includes a seventh portion adapted to <u>compute one or more errors for each computation of wetted volume, and to</u> determine a non-linearity condition of a fuel gauging system based on one or more of the computed errors.

27. (Original) The system of Claim 26, wherein the processor further includes an eighth portion adapted to optimize the error for at least one motion condition if the fuel gauging system is non-linear.

28. (Original) The system of Claim 27, wherein the at least one motion condition includes an attitude.

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